Supporting Information

Boosting microbial fuel cell performance by improving conductivity and electrogenic bacteria abundance on ZIF-67/Fe-polypyrrole

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Experimental

Text S1. Pretreatment of materials

Carbon felts (CF) were cut into 2×2 cm, soaked in acetone for 4 h to remove the surface organic matter, dried, and then rinsed with ethanol and secondary water for several times before drying, and the carbon felts were treated in a muffle furnace at 400 ℃ for 0.5 h to carbonize the surface. The commercial nafion117 proton exchange membrane was placed in 5% wt H_2O_2 and heated at 80 ℃ for 1 h. Then placed in 5% wt HCl and heated at 80 ℃ for 1 h. The membrane was rinsed with water for several times in the second rinse to neutrality and then prepared for use. The carbon rods used for cathode were polished with sandpaper of different purposes to remove the surface oil.

Text S2. Configuration of anode culture medium

When configuring Wolfe's medium, Wolfe's mineral solution was prepared by first adding NTA in 500 mL of secondary water, adjusting the solution pH to 6.5-7.0 with sodium hydroxide solution at pH 14, then adding other mineral elements, and then adding secondary water to 1000 mL. In another beaker, 0.31 g NH_4CI, 0.13 g KCl, 10.32 g Na_2HPO_4-$12H_2O$, 3.32 g Na_2HPO_4-$2H_2O$, 12.5 mL of mineral solution, and 5 mL of diluted vitamin solution, and 2 g of anhydrous CH_3COONa were added to configure 1,000 mL of anodic solution to be used for anodic anaerobic microbial culture.

Community analysis see: 16S_rDNA_report.htm

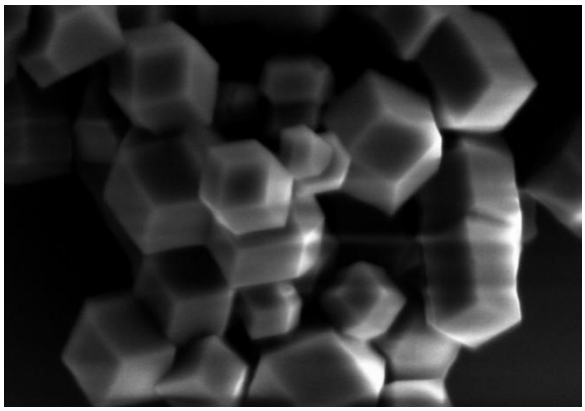

Fig. S1. SEM figure of ZIF-67

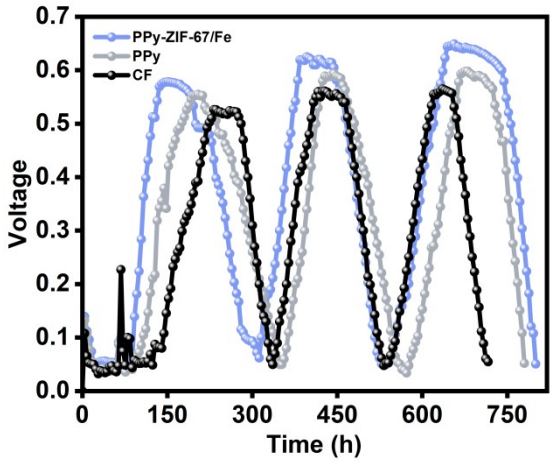

Fig. S2. Voltage variation of MFC with different anode materials.

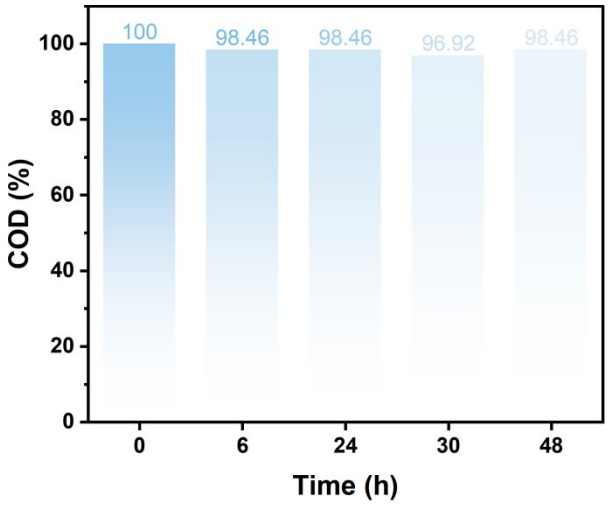

Fig. S3. COD percentage change during adsorption on ZIF-67/Fe-PPy electrode.

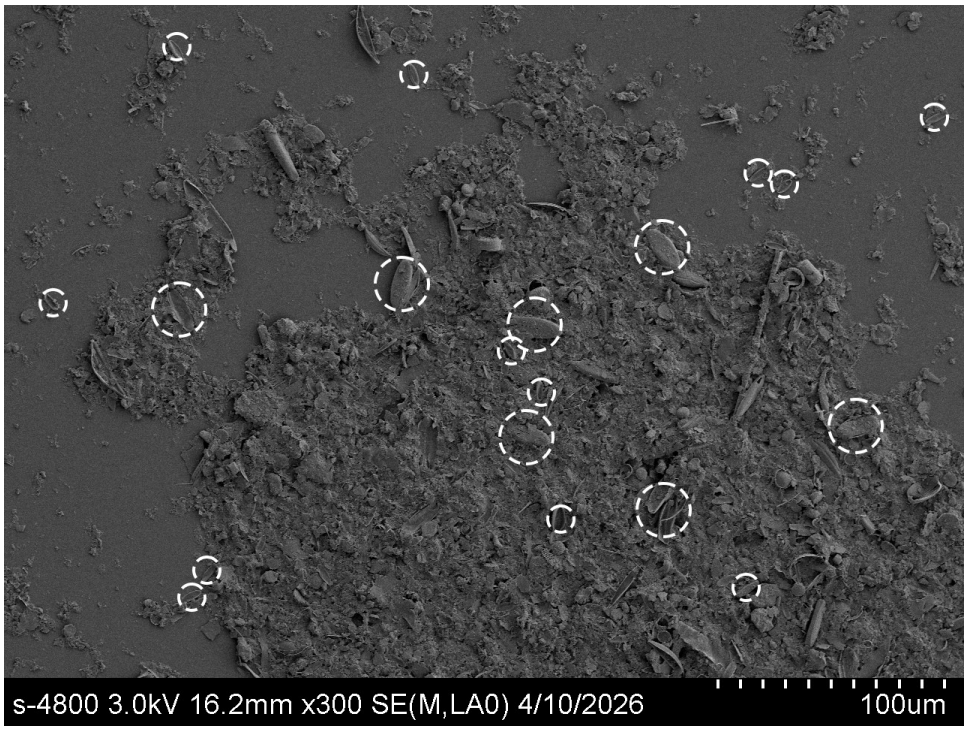

Fig. S4. Scanning Electron Microscopy (SEM) image of the supernatant of anode solution.

Table S1. The power density of different fuel cells.

No.	Type of MFC	Anodic material	Cathode materials	Power density (mW/m^2)	Refs.
1	Dual-chamber	Carbon cloth	Carbon felt	337	[1]
2	Dual-chamber	rGO/Carbon cloth	Carbon felt	1062	[1]
3	Dual-chamber	PTH NP@GF	carbon cloth	800	[2]
4	Dual-chamber	Ppy-NP@GF	carbon cloth	1220	[2]
5	Dual-chamber	carbon felt	ZIF-67/CNFs	1191	[3]
6	Dual-chamber	PPy-CMC-MXene/CC	carbon cloth	1800	[4]
7	Dual-chamber	graphite brush	Cu/Co-NC@mS-700	698	[5]
8	Dual-chamber	graphite brush	Cu/Co-NC@mS-800	932	[5]
9	Dual-chamber	graphite brush	Cu/Co-NC@mS-900	806	[5]

10	Dual-chamber	graphite brush	Cu/Co-NC-800	774	[5]
11	Dual-chamber	Co–Ni-ZIF/TM (Titanium mesh)	graphite rods	2070	[6]
12	Dual-chamber	ZIF-67/Fe-PPy	graphite rods	2180	This work

Table S2. BET surface area of PPy and ZIF-67/Fe-PPy

Materials	BET surface area ($m^2 \cdot g^{-1}$)
PPy	56.9080
ZIF-67/Fe-PPy	750.1177

References

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